

Application No. 10/675,374
 Preliminary Amendment Dated November 10, 2006

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Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the Application:

Listing of Claims:

Claims 1-16 (Canceled)

17. (Currently Amended) An investment casting core fabricated with ~~the green product by the process~~ of Claim 4 34.

18. (Currently Amended) The process of Claim 34, A process for
~~forming a green product, comprising:~~

~~mixing a ceramic powder with silicone monomers and/or oligomers to form a ceramic slurry, wherein the silicone monomers and/or oligomers contain an alkenyl~~

functionality of formula:
$$\begin{array}{c} | \\ \text{---Si---X}_a\text{---C}=\text{C} \begin{array}{l} \text{R}^1 \\ \text{R}^2 \\ \text{R}^3 \end{array} \end{array}$$
, wherein R¹, R², and R³ each independently comprise hydrogen or a monovalent hydrocarbon radical, X a divalent hydrocarbon radical and a is 0 or 1, and a hydride functionality consisting of silicon-hydrogen bonds;

~~adding a metallic catalyst compound to the ceramic slurry; and~~
~~cross linking and/or polymerizing the silicone monomers and/or oligomers to form a rigid silicone matrix.~~

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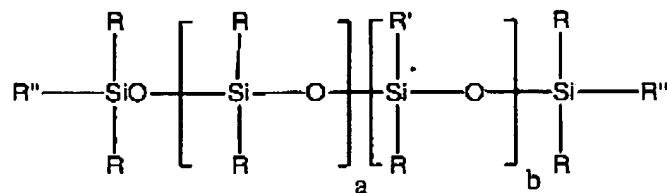
19. (Currently Amended) The process according to Claim ~~18~~ 34, wherein ~~mixing~~ the combination of the ceramic powder with the silicone monomers and/or oligomers is ~~free of a~~ carried out in the absence of solvent.

20. (Currently Amended) The process according to Claim ~~18~~ 34, wherein ~~mixing~~ combining the ceramic powder with the silicone monomers and/or oligomers first comprises mixing the ceramic powder with a dispersant.

21. (Currently Amended) The process according to Claim ~~18~~ 34, wherein cross linking and/or polymerizing the silicone monomers and/or oligomers to form the ~~rigid silicone matrix~~ core comprises heating the ceramic slurry to an elevated temperature.

22. (Currently Amended) The process according to Claim ~~18~~ 34, wherein the ~~one or more~~ silicone monomers and/or oligomers containing the alkenyl functional group is are selected from the group consisting of:

polyfunctional siloxanes of formula:

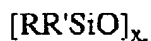


wherein R is a monovalent hydrocarbon, R' is an alkenyl radical, R'' is a monovalent hydrocarbon or an alkenyl radical, $a = 0$ to 20, inclusive, and $b = 1$ to 80, inclusive, wherein a and b are selected to provide a fluid with a maximum viscosity of 1,000 centistokes,

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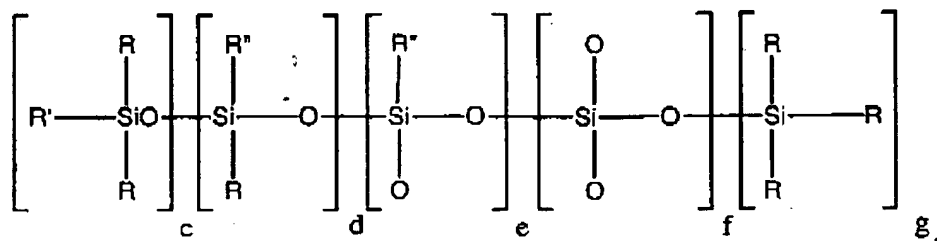
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a cyclic alkyl/alkenyl siloxane of formula:



wherein R and R' are as previously defined, and x is an integer 3 to 18 inclusive;

an unsaturated siloxane of formula:



wherein R, R', and R'' are as previously defined. Preferably, the ratio of the sum of (c+d+e+g)/f is ≥ 2 ;

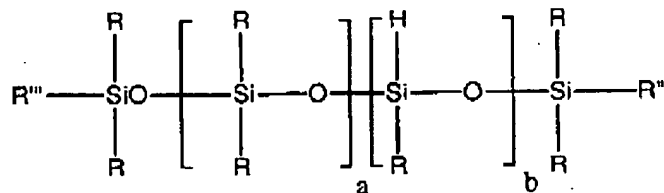
and mixtures thereof.

23. (Currently Amended) The process according to Claim 18 ~~34~~, wherein the ~~one or more~~ silicone monomers and/or oligomers containing the hydride functional group ~~is~~ are selected from the group consisting of:

a polyfunctional hydride siloxane of formula:

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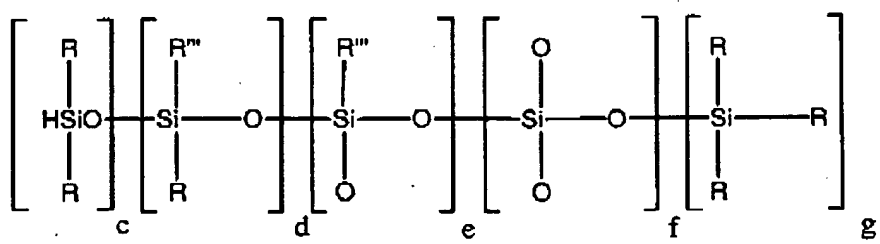
wherein R is a monovalent hydrocarbon, R''' is a monovalent hydrocarbon or hydrogen, and a and b $a = 0$ to 20, inclusive, and $b = 1$ to 80, inclusive, wherein a and b are selected to provide a fluid with maximum viscosity of 1,000 centistokes,

an alkyl/hydride ~~cyclosiloxanes~~ cyclosiloxane of formula:



wherein x is an integer 3 to 18 inclusive,

a functional hydride siloxane of formula:

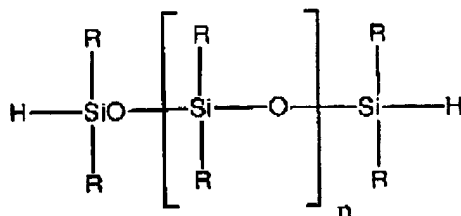


wherein a ratio of the sum of $(c+d+e+g)/f$ is ≥ 2 ,

a terminal hydride siloxane of formula:

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wherein $n = 0$ to 100, and

mixtures thereof.

24. (Currently Amended) The process according to Claim ~~18~~ 34, wherein the ~~metallic compound~~ catalyst comprises a platinum group metal catalyst.

25. (Canceled)

26. (Currently Amended) The process according to Claim ~~18~~ 34, wherein the ~~one or more~~ silicone monomers and/or oligomers containing the alkenyl functional group ~~is~~ are selected from the group consisting of 1,3-divinyl-tetramethyldisiloxane, hexavinyl-disiloxane, 1,3-divinyltetraphenyldisiloxane, 1,1,3-trivinyltrimethyldisiloxane, 1,3-tetravinyl-dimethyldisiloxane, 1,3,5-trivinyl-1,3,5-trimethylcyclotrisiloxane, 1,3,5,7-tetravinyl-1,3,5,7-tetramethylcyclotetrasiloxane, 1,3-divinyloctaphenylcyclopentasiloxane, and mixtures thereof.

27. (Currently Amended) The process according to Claim ~~18~~ 34, wherein the ~~one or more~~ silicone monomers and/or oligomers containing the hydride functional group ~~is~~ are selected from the group consisting of

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poly(methylhydrogen)siloxane, poly[(methylhydrogen)-co-(dimethyl)]siloxane; 1,3,5,7-tetramethylcyclotetrasiloxane, 1,3,5,7,9-decamethylcyclopentasiloxane, cyclic methylhydrogen siloxanes; tetrakis(dimethylsiloxy)silane, hydridodimethylsiloxy silicate $[\text{HSi}(\text{CH}_3)_2\text{O}_{1/2}]_2(\text{SiO}_2)$, and mixtures thereof. .

Claims 28-33. (Canceled)

Claim 34. (New) A process for the formation of a ceramic core, comprising the following steps:

(a) combining a ceramic powder with silicone monomers and/or oligomers, to form a ceramic slurry having a viscosity of about 1 to about 1,000 centistokes, and comprising an uncured silicone matrix; wherein the silicone monomers and/or oligomers comprise at least three alkenyl-reactive functional groups or at least three hydride-reactive functional groups per mole of monomer or oligomer;

(b) adding a metallic catalyst to the slurry;

(c) transferring the slurry to a core mold or core die;

(d) cross-linking and/or polymerizing the silicone monomers and/or oligomers to form a green product in the shape of the desired core; and

(e) heating the green product to a temperature effective to decompose the cross-linked and/or polymerized silicone monomers and/or oligomers, and to form a ceramic core which contains a silica char.

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Claim 35. (New) The process of Claim 34, further comprising the steps of disposing the core formed in step (e) within a mold for a turbine component; and introducing a turbine component-forming metallic material into the mold, wherein the core is positioned in a location suitable for the formation of a desired interior cavity within the turbine component.

Claim 36. (New) The process of Claim 35, wherein the metallic material comprises a superalloy.

Claim 37. (New) The process of Claim 34, further comprising the steps of

(f) disposing the core in a pre-selected position within a mold for a turbine component;

(g) introducing a molten metallic material into the mold;

(h) cooling the molten material, to form the turbine component within the mold;

(i) separating the mold from the turbine component; and

(j) removing the core from the turbine component, so as to form selected interior cavities within the turbine component.

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Claim 38. (New) The process of Claim 34, wherein at least one solvent is combined with the ceramic powder and silicone monomers and/or oligomers in step (a).

Claim 39. (New) The process of Claim 38, wherein the green product is dried after step (d), to remove substantially all of the solvent and form a plurality of pores within the green product.

Claim 40. (New) The process of Claim 38, wherein the green product is dried during step (d), to remove substantially all of the solvent and form a plurality of pores within the green product.